

WHAT IS CLAIMED IS:

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A7 1. A method of producing a flaky, fine powder, which comprises adding alkoxysilane and/or silicic acid solution to a dispersion containing a flaky or scaly base having a thickness of about  $1\mu\text{m}$  or less and selected from the group consisting of mica, talc and platelet shaped silica; spherical silica particles comprising  $\text{SiO}_2$  or a mixture of  $\text{SiO}_2$  with one or more of  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{MgO}$ ,  $\text{ZnO}$ ,  $\text{CeO}_2$  or  $\text{Fe}_2\text{O}_3$ , said spherical silica particles being non-porous and having an average particle size of  $0.05\text{-}3\mu\text{m}$  and being immobilized on the surface of said flaky or scaly base by hydrolyzing said alkoxysilane and/or gelling said silicic acid solution, and the permittivity ( $\epsilon$ ) of said dispersion is in the following range:

$$15 \leq \epsilon \leq 80$$

and the ion concentration (N) of the sum of cations and anions in said dispersion satisfies the following conditions,

- (a)  $200 \text{ ppm} \leq N \leq 5 \cdot 10^4 \text{ ppm}$ , when  $\epsilon$  is 15,
- (b)  $3 \cdot 10^4 \text{ ppm} \leq N \leq 2 \cdot 10^5 \text{ ppm}$ , when  $\epsilon$  is 80, and
- (c) N is in a quadrilateral area formed by A (15, 200), B (15,  $5 \cdot 10^4$ ), C (80,  $2 \cdot 10^5$ ) and D (80,  $3 \cdot 10^4$ ) in the (X,Y) coordinate system with the X axis for the permittivity ( $\epsilon$ ) (-) and the Y axis for the ion concentration (N) (ppm), when  $15 \leq \epsilon \leq 80$ .

2. A method of producing a flaky, fine powder which comprises dispersing a flaky or scaly base having a thickness of about  $1\mu\text{m}$  or less selected from the group consisting of mica, talc and platelet shaped silica; and spherical silica particles comprised of  $\text{SiO}_2$  or a mixture of  $\text{SiO}_2$  with one or more of  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{MgO}$ ,  $\text{ZnO}$ ,  $\text{CeO}_2$  or  $\text{Fe}_2\text{O}_3$  in a dispersion medium comprising an organic solvent and/or water to

adhere said spherical silica particles on the surface of said flaky or scaly base, then adding alkoxysilane and/or silicic acid solution to the obtained dispersion, said spherical silica particles being non-porous and having an average particle size of 0.05-3  $\mu\text{m}$  and immobilized on the surface of said flaky or scaly base by hydrolyzing said alkoxysilane and/or gelling said silicic acid solution, and the permittivity ( $\epsilon$ ) of said dispersion is in the following range:

$$15 \leq \epsilon \leq 80$$

and the ion concentration (N) of the sum of cations and anions in said dispersion satisfies the following conditions:

- (a)  $200 \text{ ppm} \leq N \leq 5 \cdot 10^4 \text{ ppm}$ , when  $\epsilon$  is 15,
- (b)  $3 \cdot 10^4 \text{ ppm} \leq N \leq 2 \cdot 10^5 \text{ ppm}$ , when  $\epsilon$  is 80, and
- (c) N is in a quadrilateral area formed by A (15, 200), B (15,  $5 \cdot 10^4$ ), C (80,  $2 \cdot 10^5$ ) and D (80,  $3 \cdot 10^4$ ) in the (X,Y) coordinate system with the X axis for the permittivity ( $\epsilon$ ) (-) and the Y axis for the ion concentration (N) (ppm), when  $15 \leq \epsilon \leq 80$ .

3. A flaky, fine powder comprising a flaky or scaly base having a thickness of about 1  $\mu\text{m}$  or less and selected from the group consisting of mica, talc and platelet shaped silica; and spherical silica particles comprised of  $\text{SiO}_2$  or a mixture of  $\text{SiO}_2$  with one or more of  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{MgO}$ ,  $\text{ZnO}$ ,  $\text{CeO}_2$  or  $\text{Fe}_2\text{O}_3$ , and said spherical silica particles being non-porous and having an average particle size of 0.05-3  $\mu\text{m}$  and covering the surface of said flaky or scaly base.

4. The flaky, fine powder according to claim 3, wherein said spherical silica particles are immobilized on the surface of said flaky or scaly base by a hydrolysate of alkoxysilane and/or silica gel.

5. A method of producing a flaky, fine powder which comprises:

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dispersing a flaky or scaly base having a thickness of about  $1\text{ }\mu\text{m}$  or less selected from the group consisting of mica, talc and platelet shaped silica; and spherical silica particles comprised of  $\text{SiO}_2$  or a mixture of  $\text{SiO}_2$  with one or more of  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{MgO}$ ,  $\text{ZnO}$ ,  $\text{CeO}_2$  or  $\text{Fe}_2\text{O}_3$  in a dispersion medium whereby said spherical silica particles being non-porous and having an average particle size of  $0.05\text{-}3\text{ }\mu\text{m}$  are deposited on a surface of said flaky or scaly base, and a flaky, fine powder is obtained by filtering, washing and drying the obtained dispersion, and the permittivity ( $\epsilon$ ) of said dispersion is in the following range:

$$15 \leq \epsilon \leq 80$$

and the ion concentration (N) of the sum of cations and anions of said dispersion satisfies the following conditions:

- (a)  $200\text{ ppm} \leq N \leq 5 \times 10^4\text{ ppm}$ , when  $\epsilon$  is 15,  
(b)  $3 \times 10^4\text{ ppm} \leq N \leq 2 \times 10^5\text{ ppm}$ , when  $\epsilon$  is 80, and  
(c) N is in a quadrilateral area formed by A (15, 200), B (15,  $5 \times 10^4$ ), C (80,  $2 \times 10^5$ ) and D (80,  $3 \times 10^4$ ) in the (X,Y) coordinate system with the X axis for the permittivity ( $\epsilon$ ) ( - ) and the Y axis for the ion concentration (N) (ppm), when  $15 \leq \epsilon \leq 80$ .

6. The method according to claim 5, further comprising immobilizing said spherical silica particles on the surface of said flaky or scaly base by adding a sufficient quantity of alkoxysilane and/or silicic acid solution.

7. The method according to claim 5, further comprising immobilizing said spherical silica particles on said surface of said flaky or scaly base by adding a sufficient quantity of alkoxysilane and hydrolysing said alkoxysilane.

8. The method according to claim 7, wherein said alkoxysilane is a compound having the formula:



wherein R is an alkyl group with a carbon number of 1 to 7.

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A3 9. The method according to claim 5, further comprising immobilizing said spherical silica particles on the surface of said flaky or scaly base by adding a sufficient quantity of silicic acid solution and gelling said solution.

10. A flaky, fine powder comprising a flaky or scaly base having a thickness of about 1  $\mu\text{m}$  or less selected from the group consisting of mica, talc and platelet shaped silica; and spherical silica particles comprised of  $\text{SiO}_2$  or a mixture of  $\text{SiO}_2$  with one or more of  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{MgO}$ ,  $\text{ZnO}$ ,  $\text{CeO}_2$  or  $\text{Fe}_2\text{O}_3$ , and said spherical silica particles being non-porous and having an average particle size of 0.05-3  $\mu\text{m}$  which adhere to the surface of said flaky or scaly base.

11. The flaky, fine powder according to claim 10, wherein said spherical silica particles are immobilized on said flaky or scaly base by hydrolysate of alkoxysilane, and/or silica gel.

12. A cosmetic comprising a flaky fine powder produced according to the method of claim 5.

13. A cosmetic comprising a flaky, fine powder produced according to the method of claim 1.

14. A cosmetic comprising a flaky, fine powder produced according to the method of claim 2.

15. A cosmetic comprising a flaky, fine powder as claimed in claim 3.

16. A cosmetic comprising a flaky, fine powder as claimed in claim 4.

17. A cosmetic comprising a flaky, fine powder as claimed in claim 10.

18. A cosmetic comprising a flaky, fine powder, said flaky, fine powder comprising a flaky or scaly base having a thickness of about 1  $\mu\text{m}$  or less and selected

from the group consisting of mica, talc and platelet shaped silica; and non-porous spherical silica particles comprised of  $\text{SiO}_2$  or a mixture of  $\text{SiO}_2$  with one or more of  $\text{Al}_2\text{O}_3$ ,  $\text{ZrO}_2$ ,  $\text{MgO}$ ,  $\text{ZnO}$ ,  $\text{CeO}_2$  or  $\text{Fe}_2\text{O}_3$ , said non-porous spherical silica particles having an average particle size of  $0.05\text{-}3\ \mu\text{m}$  covering the surface of said flaky or scaly base, wherein said cosmetic exhibits homogeneous light distribution characteristics as shown in Figures 6-8 and 10.

19. The cosmetic according to claim 12, wherein said cosmetic exhibits homogeneous light distribution characteristics as in Figures 6-8 and 10.

20. The cosmetic according to claim 13, wherein said cosmetic exhibits homogeneous light distribution characteristics as shown in Figures 6-8 and 10.

21. The cosmetic according to claim 14, wherein said cosmetic exhibits homogeneous light distribution characteristics as shown in Figures 6-8 and 10.

22. The cosmetic according to claim 15, wherein said cosmetic exhibits homogeneous light distribution characteristics as shown in Figures 6-8 and 10.

23. A method of producing a flaky, fine powder having improved light scattering properties, which comprises hydrolyzing tetraethoxysilane in a dispersion containing mica flakes each having a thickness of about  $1\ \mu\text{m}$  or less, to thereby precipitate and immobilize on the surface of said mica flakes non-porous spherical silica particles having an average particle size of  $0.05\text{-}3\ \mu\text{m}$  and wherein the permittivity  $\epsilon$  of said dispersion is in the following range:

$$15 \leq \epsilon \leq 80$$

and the ion concentration (N) of the sum of cations and anions in said dispersion satisfies the following conditions:

(a)  $200\ \text{ppm} \leq N \leq 5 \cdot 10^4\ \text{ppm}$ , when  $\epsilon$  is 15,

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- (b)  $3 \cdot 10^4 \text{ ppm} \leq N \leq 2 \cdot 10^5 \text{ ppm}$ , when  $\epsilon$  is 80, and
- (c)  $N$  is in a quadrilateral area formed by A (15, 200), B (15,  $5 \cdot 10^4$ ), C (80,  $2 \cdot 10^5$ ) and D (80,  $3 \cdot 10^4$ ) in the (X,Y) coordinate system with the X axis for the permittivity ( $\epsilon$ ) ( - ) and the Y axis for the ion concentration (N) (ppm), when  $15 \leq \epsilon \leq 80$ .

24. A flaky, fine powder having improved light scattering properties produced by the method of Claim 22.

25. A cosmetic comprising a flaky, fine powder having improved light scattering properties according to Claim 23.

26. The cosmetic of Claim 24, wherein said cosmetic exhibits homogeneous light distribution characteristics as shown in Figs. 6-8 and 10 herein.

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